A CORRELATION STUDY BETWEEN PLAYING ABILITY AND SELECTED ANTHROPOMETRICAL, PHYSICAL FITNESS AND PHYSIOLOGICAL VARIABLES AMONG COLLEGE LEVEL VOLLEYBALL PLAYERS

SYNOPSIS

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INTRODUCTION

Volleyball is a popular sport that can be played indoors or outdoors and is enjoyed by people of all ages and skill levels. The game is played between two teams and there is one player from each team and the aim is to score a goal by hitting the ball over the net into the opponent's goal. Players can use any part of their body to hit the ball, as long as they are not carrying, holding or throwing the ball. The game requires teamwork, coordination and quick practice, making the game fun and challenging for players of all levels. The team also fired three-pointers in addition to blocking contact. While running, the ball is served and then hits the opponent over the net. In addition to the blocked contact, the team took back 3 hits. While running, the ball is in play and then hits the ball to the opponent over the net. Play does not continue until the ball lands on the court, goes "out-of-bounds" or one of the teams fails to spin the ball correctly. The winning team in a baseball tournament gets one point (rally point system). When the winners win the match, they get a point, have a chance to serve and move one of their players according to the clock. One of the most successful and well-liked competitive and leisure sports in the world is volleyball. The action is rapid, fast-paced, and entertaining. Yet volleyball has a number of essential overlapping components whose beneficial interactions set it apart from other rally games. William G. Morgan created volleyball in 1895 at the Y.M.C.A. in Holyoke, Massachusetts. A Volleyball has evolved into a fiercely competitive sport that calls for both extreme physical and mental preparedness. High levels of competition call for faster, more abrupt motions and rapid reactions.

A basketball game can go on for hours with no time limit if both sides are evenly matched. (2000) Indu Ramchandani Physical, mental and physical activity is movement. Physical, mental and physical guidance for sports fans is important for sports training, sports guidance and various sports skills and sports training in today's competition. Organizations are created not only to excel in sport, but also to win through action. Therefore, a capacity limit is now needed to allow action that is unsatisfactory for mental health. But the most important challenge is the hearts of people who love the game, participate in the game and excel.

REVIEW OF RELATED LITERATURE:

Yuyi Zhang (2010) conducted a study to identify the anthropometric characteristics of top Chinese female athletes to address the differences between anthropometric characteristics and physical performance among people playing in various basketball positions, and the results showed that in addition to epicondylar femur width: calf circumference and calf length index is associated with running and jumping height, but most anthropometric factors are negatively associated with physical performance selection. Find the connection between these two things. 31 anthropometric measurements and four physical tests (throwing, vertical jump, T-shuttle agility test). Instructor 9.7 out of 40 years older than the average player, average age 22.3 3.6(SD) years. The average height, weight, sitting height, standing height and BMI reading of female basketball players in China is 183.6, 5.8, 70.5, 7.6, 95.7, 3.5, 236.7, 7.8, 20.9, 2.0 a. These baseball players are taller, have shorter sit heights, longer forearm, hand, calf, and Achilles tendon lengths, wider femur, iliac crest, and biochemical widths, smaller wrist and ankle circumferences, smaller ankle circumferences, and small skin folds. has. The results also show that most anthropometric parameters have no relationship to selected physical performance, except for the index of epicondylar femur width, calf circumference, and calf length, which are associated with running and high jumping. There are significant differences in the characteristics of athletes in various basketball positions, especially in measurements of weight, height, standing forward height, radial palm length, acromion -digital length, average palm length, iliac spine height, and tibia. body length, shoulder width, double crest width, chest width and waist circumference (all $P< 0.001$). However, the only significant difference between the positions in the physical performance of the players was the height at which they ran and jumped. The average body shape reading of elite Chinese female athletes is in the range of "3" for endomorph and ectomorph. According to the results of this study, it was determined that anthropometric parameters such as weight, height, sitting height, biochemical width, subscapular skin fold, ankle circumference and forearm circumference should be taken into consideration when selecting female basketball players.

Koley et al (2010) analyzed anthropometric data of Indian intercollegiate volleyball players and examined the relationship between body mass index, body fat percentage, hand grip strength (right surprise) and maximum oxygen. along with

other investigated anthropometric features. From Guru Nanak Dev University (38 men and 25 women) in Amritsar, Punjab, India, ages 18 to 25, 11 anthropometric traits, 4 body composition, 2 body and body variables, and 9 anthropometric traits measured on the arm. Findings showed that male basketball players were higher (6. Compared to the control group, it was 63% heavier (7.31%), while female athletes were slightly taller (0.31%) and lighter (3.74%). ANOVA was significant in all variables (except waist circumference) (p0.004-0.000) the difference between basketball and control group. Significant correlations were found between BMI of baseball players and 19 other variables, body fat percentage and 6 other variables, right hand grip strength and 20 other variables, and Vo2max and 19 other variables. A significant negative correlation was found between body fat percentage and 16 other variables, hand grip strength and 7 other variables, and Vo2max and 8 other variables. Current findings may inform future research on skill recognition, player selection, and training improvement in basketball players.

Viswanathan & Chandrasekaran (2011)

The selected participants were divided into three groups according to their positions on the field as guard (GD=72), forward (FD=126) and middle (CR=78). Anthropometric measurements selected: body weight, biceps, subscapularis, triceps, supraspinae, abdomen, iliac crest, anterior thigh and inner calf skinfold measurement (mm), arm circumference when bent (cm), arm circumference when bent (cm), and calf circumference, length measured for standing height (cm), arm span, arm length, legs - independent Height variables used in this study were humerus width and femur width. These data were collected during the competition using scientific evidence following the International Association for the Advancement of Anthropometry (ISAK) standard testing method. The standard of the three basketball coaches who know how to evaluate the game of the selected players is different. Correlation coefficients were used to establish the relationship between anthropometric features and teacher-rated games. Particular attention is paid to efforts to create balanced forecasts using anthropometric features related to performance analysis to create a consistent forecasting model (parameter selection process). The findings showed a significant correlation ($r = 0.9$) between play process and all of the following: height, weight, arm length, arm length, leg length, and arm length around the arm.

STATEMENT OF THE PROBLEM

The goal of this study is to determine whether certain anthropometric,physical fitness,and physiological factors among male collegiate volleyball players correlate with the playing skill.

OBJECTIVES OF THE STUDY

The following are the precise goals.

1) To research the anthropometric, physiological, and physical fitness characteristics of volleyball players.

2) To research volleyball players' skills on the court.

3) To research the effects of anthropometric, physical fitness, and physiological factors on volleyball players' playing abilities.

4) To correlate dependent factors and their impact on volleyball players' performance on the court.

5) To determine how anthropometric, physical-fitness, and physiological factors affect volleyball players' ability to play the game.

HYPOTHESIS

1. It is hypothesized that certain anthropometric traits will not be associated with playing ability among male collegiate volleyball players .
2. It is hypothesized that playing skill among male collegiate volleyball players will not be associated with particular levels of physical fitness.
3. It is predicted that certain physiological traits and volleyball playing ability among male collegiate volleyball players won’t be associated .

SIGNIFICANCE OF THE STUDY

1. This research will help basketball coaches and physical education teachers design specific training programs to identify abilities associated with better performance.

2. To conduct research on the competitiveness of men's basketball.

3. Using this finding as a screening tool can help identify and classify basketball players.

4. The results of this study may encourage young researchers to do research in other fields and disciplines.

DELIMITATIONS

The study's guidelines and limitations are as follows:

1. Male intercollegiate volleyball players from different colleges in the Indian state of Uttar Pradesh will be the subject of the study.
2. Only 120 intercollegiate volleyball players will be included in the study.
3. Only people between the ages of 18 and 25 will be allowed to participate in the study.

LIMITATIONS

1. The research will be limited to the following:
2. 1. The research will be considered limited due to the differences in the play of the players due to their participation in the competition.
3. 2. Different factors such as food, rest and sleep will be considered as study constraints as the researcher cannot control them.
4. This study will be limited as people come from different health groups and have different time preferences for nutrition, lifestyle, training and play.
5. 4. Do not use specific strategies to address people during the test.

METHODOLOGY

SELECTION OF PARTICIPANTS

The aim of this study is to estimate the playing skills of male basketball players using anthropometric, physical and physiological data. To achieve this goal, 200 basketball players aged 18 to 25 will be selected from various schools in Uttar Pradesh, India. This study included people who played basketball for only three years and played in college teams.

SELECTION OF VARIABLES

Anthropometric Variables

- Standing Height
- Arm Length
- Hand Length
- Palm Length
- Leg Length

- ❖ Thigh Girth
- ❖ Calf Girth
- ❖ Arm Girth Relaxed
- ❖ Arm Girth Flexed
- ❖ weight

Physical Fitness Variables

- Speed
- Agility
- Strength Endurance
- Muscular Endurance

Physiological Variables

- Peak Expiratory Flow Rate
- Vital Capacity
- Vo2 Max
- Resting Heart Rate

SELECTION OF TEST

The test might be used on this examination for the gathering of data.

1. ANTHROPOMETRIC VARIABLES

VARIABLES	UNIT OF MEASUREMENT	TEST DESCRIPTION	INSTRUMENT
Height	Centimeter	Maximum height from the ground to the highest point of the head (peak) when the person is facing forward and standing.	Stadiometer
Weight	Kilogram	When recording weight, the person remains motionless and undisturbed and looks straight ahead, with the weight equal to the center of the scale.	Weighing machine

Arm span	Centimeter	the distance, measured at the fingertips, between the ends of a person's arms when they are lifted at shoulder height, parallel to the ground, and at a one-hundred eighty-degree angle.	Anthropometric tape
Hand length	Centimeter	The distance from the marked mid-stylion to the dactylion.	Small bone caliper
Hand breadth	Centimeter	the separation between the metacarpal medial and lateral.	Small bone caliper
Leg length	Centimeter	the vertical separation between the Trochanter ion and the foot's base.	Anthropometric tape
Arm girth flexed	Centimeter	Arm circumference measured at the mid-acromial-radiale location.	Measuring tape
Arm girth relaxed	Centimeter	Arm circumference measured perpendicular to its long axis at the point where the contracted biceps brachii are at their highest.	
Forearm girth	Centimeter	Circumference of the forearm at the site of maximum girth.	
Wrist girth	Centimeter	taken distally, the wrist's circumference to the processes of the styloid..	
Thigh girth	Centimeter	the mid trochanterion-tibiale laterale level of the thigh, perpendicular to the long axis of the femur.	

Calf girth	Centimeter	Leg circumference measured levelly the calf site's medial region.	

2. PHYSICAL FITNESS PARAMETER

A. SPEED: 50 METER DASH

Criterion Measures: A 50-yard dash test will be performed to gouge speed (Johnson, Borrey, and Nelson Jack. 1988.).

Purpose: To ascertain the subject's speed.

Equipment: Pen, Pencil, Paper, Stop Watches, Track, Marking Powder and Measuring Tape.

Test administration: At the locations where data will be gathered, the experiment will be conducted on the track. At the site of the experiment, the test will be conducted one at a time, individually, with the participant, assistants, and researcher present. Before beginning the real test the subjects will first get information about the format and objectives of each test. the subject will receive a demo before registering for the test.

Procedure: The tester will give the individuals some initial instructions. Participants will be told to line up behind the starting line after warm up and wait for the signal GO". Pairing works best. At the finish line, separate volunteers equipped with stop watches will keep an eye on each subject. The sprinters will start their dashes at the GO " as the timers start their respective stopwatch. As soon as the subject crosses the finish line, the pertinent timer stops the stopwatch and accurately records the time to the nearest 0.01 seconds. The course duration will be calculated in seconds and reported to the closest hundredth of a second. Two trials will be given to each participant, with the best one being used to calculate the score.

B. AGILITY (SHUTTLE RUN)

Purpose: to gauge volleyball players' agility.
Equipment Required: On the ground, 30 yards apart, are drawn two parallel lines. A stopwatch and two wooden blocks are required.
Procedure: The two blocks must be placed at one line, where the subjects must stand. The subjects have rushed to the blocks after receiving the instruction to do so, and have positioned the block behind the starting line after returning there. On his way back, he carried the second block across the starting line. He is now back at the second block. To return the blocks for each race, two trials were required.
Scoring: The best of two trials is scored based on the elapsed time, which is recorded in seconds and tenths of seconds.

C. STRENGTH ENDURANCE (30 SECOND ENDURANCE JUMP)

Purpose: Volleyball players' strength and endurance are being evaluated.
Stopwatch and a SPARQ Soft Endurance Hurdle (12" high) are necessary pieces of equipment.
Procedure: Standing straight and comfortably facing the obstacle with both feet flat on the ground. The timing begins with the very first motion. The athlete jumps off both feet, lands on the other side of the hurdle with both feet, and then jumps back. The test is repeated for a further 30 seconds while the total leaps are recorded.
Scoring: The total number of successful leaps within the time frame is kept track of.

D. MUSCULAR ENDURANCE (SIT UPS)

Purpose: To gouge volleyball players' muscle stamina.
Equipment Required: Mats, stopwatch.
Procedure: These people lie on their back with one foot flat on the floor, knees bent, and heels no more than a meter from their hips. The knee angle should be at least 90 degrees. Fingers are interlocked and placed under the neck; elbows are placed on the floor. Feet firmly fixed by partner. The men sat with their knees to their chests, their bodies unmarked.
Scoring: The number of sit ups competed in the allotted 60 seconds determines the score.

3. PHYSIOLOGICAL PARAMETERS

A. PEAK EXPIRATORY FLOW RATE (PEAK FLOW METER)

Purpose: To measure the maximum expiratory pressure of volleyball players.

Equipment Required: The maximum expiratory pressure (MEP)will be measured using a peak flow meter.

Procedure: At the beginning of the test, subjects were given a pressure gauge and asked to stand upright. Prior to this, subjects were shown a guide by the researchers. Before testing, patients inhaled twice. The student makes sure that no air comes out of the patient's mouth or nose. While holding the peak flow meter in place, take a deep breath and then push all the air into the peak flow meter capacity. Use the peak flow meter according to the recommendations made by the peak flow meter experts. The PFM should be flat and not touching the index finger or blocking the edges.
Calculation Fraction: Peak flowmeter displays data in liters/minute or L/MIN. Save the note and add its value to the data collection.

B. VO2max (MAXIMUM OXYGEN CONSUMPTION):

Criterion Measures: VO2max (maximum oxygen consumption) will be measured with the help of Rockport calculator software.
Purpose: This test is designed to measure maximum oxygen consumption.
Equipment: Computer/laptop, pen, pencil and paper
Test Practice:

- The route will be open on quiet days.
- Hold a heavy wheel.
- Run/walk a mile [1609 meters] as fast as you can.
- Remember how far you walked a mile. After the walk is over, immediately note the heart rate [in beats per minute].
- Make use of the Rockport calculator below to determine your VO2max.

Procedure: Enter your gender, age, weight, and final heart rate as well as the duration of the run/walk test to get an estimate of your VO2max, and then click the "Calculate" button.

VO2max is calculated using the following equation: VO2max = 132.853 - 0.0769 x weight - 0.3876 x age - 6.31 x gender - 3.2649 x time - 0.1565 x heart rate.

C. **RESTING PULSE RATE (STETHOSCOPE)**

Purpose: To assess the resting pulse rate of players.

Equipment's required: Stethoscope and watch time.

Procedure: The earphones of the stethoscope are inserted to the testers earsto measure the subject's heartbeat; the bell of the stethoscope is placed on the radial pulse to allow the subject to measure his or her own heartbeat.

Scoring: For a minute, heart rate will be monitored.

D. VITAL CAPACITY (SPIROMETER)

Purpose: To gauge basketball players' critical capacities.

Equipment required A Windows-based computer is required in order to operate the Spirometer Helios 401.

Procedure It features a hand piece with a turbine transducer inside of it. A USB interface cable is used to connect this handpiece to a computer. Spirometer maneuvers are recorded using the system's included software, which also offers a possible diagnostic. The computer monitor displays the spirometry parameters, device parameters, informational messages, and user manual messages. Using the printer connected to the computer, a physical copy record to the maneuver and the pertinent parameter values can be obtained.

OVERALL PLAYING ABILITY

A three-person expert panel will evaluate the criteria measure of overall playing skill. They excelled as volleyball players at the state level in the past and have been recognized coaches for almost ten years. The experts will be requested to provide a personal evaluation on the players' collective playing skill using a 10-point scale. The participants' scores on blocking, forearm passing, spiking, fitness, playing positions, serving, and defensive actions will be listed on the framed score sheet. The subjects' grade was determined by taking into account the three experts' average ratings on playing ability as a whole.

STATISTICAL TECHNIQUE

Using Pearson product-moment correlation coefficients, interrelationship between the chosen anthropometric, physical, and physiological characteristics and volleyball playing skill will be calculated through the volleyball players. Multiple regression calculations will also be made. Level of significance will be set at 0.05 to check for significance.

BIBLIOGRAPHY

- Barrick, M.R, Mount and Judge, T.A. (200) Personality and performance at the beginning of the new millennium: What do we know and where do we go next? International Journal of selection and assessment,9,9-30.
- Duda, J.L., and Nicholls, J.G. (1992). Dimensions of achievements, motivation in school work and sports. Journal of educational psychology, 84, 290-299.
- Klein. (1990). Anxiety and sports performance. A meta-analysis. Anxiety research,2,1132131.
- Kristjan, K., and Lennart, R., (2005). Intensity and direction of competitive state anxiety, self-confidence and performance. Kinesiology,37(1),13-20.
- Rami, A.C. and Silawat, N., (20090 A study of the psychological factors, Anthropometric measurement and physical fitness of selected university players in Gujrat. Shodh, Samiksha aur Muliyankan (international research journal)- ISSN-0974-2832 Vol.II, issue-6.
- Sallet, J.J., Perrier D, Ferret JM, Vitelli V, Baverel G (2005). Physiological difference between volleyball players as a function of playing position and level of play. J. Sports Med. Phys. Fitness, 45:291-294.